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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/511,471

05/03/2005

Michael Muller

126-05

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23713

7590

09/04/2007

GREENLEE WINNER AND SULLIVAN P C

4875 PEARL EAST CIRCLE

SUITE 200

BOULDER, CO 80301

EXAMINER

FORTUNA, ANA M

ART UNIT

PAPER NUMBER

1723

MAIL DATE

DELIVERY MODE

09/04/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/511,471	MULLER ET AL.	
	Examiner	Art Unit	
	Ana M. Fortuna	1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 May 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 and 38-54 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9, 10, 13-15, 22, 26-33, 38-39, 41, 43, 45 and 47-54 is/are rejected.
- 7) ☒ Claim(s) 8, 11, 12, 16-21, 23-25, 40, 42, 44 and 46 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/18/04</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 5, 9, 10, 13, 27-29, 33, 38 39 rejected under 35 U.S.C. 102(b) as being anticipated by Koontz (US 6,022,902). Patent '902 discloses gas plasma treatment of microporous membranes in any shape by a gas mixture including an inert gas, e.g argon, and a gas providing functional amino groups on the membrane (functional groups), e.g. ammonia (example 3, claims 1-19; abstract, column 2, lines 25-68; column 4, lines 1-30; column 7, lines 16-19, and lines 37-through column 8, line 7). The use of the functionalized membrane in purification of biochemicals is disclosed in the patent (abstract, column 2, lines 19-23). As to claims 2-3, microporous membranes with pore size of 1-2000 microns (column 23, claims 8-9, column 6, third paragraph, column 7, second paragraph).

Regarding claim 5, providing the functional groups at the interior and exterior surfaces is also disclosed (column 16, last paragraph). The carrier gases and relative gases are disclosed (see column 7, last paragraph bridging column 8). The process of making the membrane discussed above result in a membrane having the properties of claims 27-29, and 38. The adsorption properties of claim

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33 are inherent of the functionalized membrane containing the amino groups, as discussed above. As to claim 39, the carrier gases as discussed above in the discussion of claim 9.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-7, 9, 10, 13, 14, 41, 15, 22, 26, 27, 28, 29, 30-33, 38, 39, 41, 43, 45, 47, 49, 50, 51, 52, 53, 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams et al (US 6,245,537). Patent '537 discloses an affinity membrane having affinity for blood or other biologically active fluids and the process of treating the membrane with gas plasma in the presence of a gas mixture comprising a modifying gas, to provide modifying functional groups onto the membrane surface, as claimed in claim 1 (abstract, column 3, lines 41-62; column 13, lines 2-31; column 7, lines 25-40, column 8, lines 20-48; column 9, lines 53-68; and column 16, lines 56-64).

Patent to Williams et al ('537) fails to teach the membrane as "microporous"; the patent instead produces porous sizes between 80 to 180 microns (column 23, lines 22-28), or between 20 and 200 microns (column 22, line 68-page 23, line 6). Patent '537, however, suggests making the membrane with a desired pore size, e.g. small enough to block out cells and tissue matter (column 12, 13-17),

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and further teaches controlling the porosity by selecting a leachable material with different particle size, in the process of making the membrane by solvent casting.

One skilled in the pertinent art at the time this invention was made following the suggestions in patent '537 would have been motivated to make membranes of lower pore size to provide a lower degree of retention for a desire intended purpose, by using a leachable material (pore former) with lower particle size.

As to claims 2-3, the patent teaches the flat (film) configuration and a tubular configuration, and the membrane provided on to a support (column 13, lines 10-13; column 23, lines 34-38). Using a support in tubular configuration or hollow fiber would have been obvious to the skilled artisan at the time this invention was made, based on the "tubular" configuration suggested in this patent.

Limitations of claims 4-7 and 9, are further disclosed (column 7, lines 26-55; column 8, lines 20-53; column 9, lines 27-68).

Regarding claim 10, the carrier gas and gases combination is disclosed in this patent (column 9, lines 63-66).

As to claim 13, the treatment includes at least one step treatment, which covers the lower range of "up to 10 cycles".

As to claim 15, the application of plasma treatment is not limited to a particular surface; treating the "polymer" (membrane) is disclosed, which suggest all the surfaces (column 9, last paragraph).

Limitations of claims 27-33 and 38, correspond to resulting modified membrane, discussed above; the peptides and amino groups are disclosed in the references (column 7, lines 28-32; column 8, lines 44-46).

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In regard to claim 39, nitrogen is added during the plasma treatment (see column 25, 7-8).

As to claim 43, the term bundle is not disclosed, however, as discussed above membranes with tubular configuration, and provided on a desire configuration support is disclosed; the term "up to 1000 fibers" includes a single fiber.

The membrane thickness, claim 45, is further disclosed in the patent above (column 13, lines 9-10)

As to claim 47, the device is and inherent detecting device, since compounds from blood are attached to the functional groups provided on the membrane material or porous functionalized materials. As to claims 51-54, the reaction between the blood or biological fluids with the functionalized porous material is discussed above.

As to claims 14, 22, 26, and 41, providing the membrane into a housing for performing the gas plasma treatment is not disclosed in the reference. One skilled in the art at the time this invention was made can predict that functionalization, by gas plasma as disclosed in this patent, can be expected when contacting the membrane surface with the mixture of gases under the conditions disclosed in patent '537, independently of whether the membrane is provided within a housing or e.g. on a supporting frame or other structure that allows the surface to be in contact with the gas reacting mixture.

Allowable Subject Matter

5. Claims 8, 11, 12, 16-21, 23-25, 40, 42, 44, 46 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in

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independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter: combination of limitations as claimed in the objected claims are not disclosed or suggested in the prior art of record. Performing the gas plasma functionalization of the membrane surface at the claimed conditions is not suggested or disclosed in the prior art of record.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Additionally cited references represent the state of the art in affinity membranes or membranes provided with functional groups and use in treating biological fluids.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ana M. Fortuna whose telephone number is (571) 272-1141. The examiner can normally be reached on 9:30-6:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Sample can be reached on (571) 272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ana M Fortuna
Primary Examiner
Art Unit 1723

/af
August 28, 2007

/Ana Fortuna/
Primary Examiner, A. U. 1723